

The Environmental Performance of Participatory and Collaborative Governance: A Framework of Causal Mechanisms

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Many have advocated for collaborative governance and the participation of citizens and stakeholders on the basis that it can improve the environmental outcomes of public decision making, as compared to traditional, top-down decision making. Others, however, point to the potential negative effects of participation and collaboration on environmental outcomes. This article draws on several literatures to identify five clusters of causal mechanisms describing the relationship between participation and environmental outcomes. We distinguish (i) mechanisms that describe how participation impacts on the environmental standard of outputs, from (ii) mechanisms relating to the implementation of outputs. Three mechanism clusters focus on the role of representation of environmental concerns, participants' environmental knowledge, and dialogical interaction in decision making. Two further clusters elaborate on the role of acceptance, conflict resolution, and collaborative networks for the implementation of decisions. In addition to the mechanisms, linking independent with dependent variables, we identify the conditions under which participation may lead to better (or worse) environmental outcomes. This helps to resolve apparent contradictions in the literature. We conclude by outlining avenues for research that builds on this framework for analysis.

KEY WORDS: environmental governance, effectiveness, modes of governance, stakeholder involvement, deliberation, causal hypotheses, collective learning, public policy

很多人支持合作治理和公民与利益相关方的参与，因为与传统的自上而下地决策相比较，它可以改善公共决策对环境的影响。然而，另一些人指出参与和合作会对环境造成负面影响。本文通过不同文献分支识别了关于描述参与和环境结果之间因果机制的五个类群。我们将（a）那些描述了参与如何影响环境产出标准的机制与（b）那些与产出执行的机制相区别。这三个机制群聚焦于环境问题代表，参与者的环境知识和决策过程中的对话互动。另外两个类群阐述了决策执行中接受，冲突处理和合作网络的角色。除了这些机制，我们将自变量与因变量相联系，识别了何种情况下参与会导致更好的（或更坏的）环境结果。这帮助我们解决文献中的明显冲突。我们以此研究框架下可研究的问题作结。

To advocate democracy is to advocate procedures, to advocate environmentalism is to advocate substantive outcomes: what guarantee can we have that the former procedures will yield the latter sorts of outcomes?

—Goodin (1992, p. 168)

1. Governance Modes as Interventions: Moving Beyond Competing Claims about Effectiveness of Participation and Collaboration

Scholars and public administrators are increasingly engaging with participatory and collaborative modes of governance in order to improve environmental outcomes of public decision making. The motives and rationales for public participation, which have traditionally centered around notions of emancipation and legitimacy, have been shifting toward an expectation of increased effectiveness of governance. Following this instrumental rationale (Newig, 2012), participation is advocated and used to open up decision making, integrating local knowledge, and the perspectives of a multitude of actors (Edelenbos, Van Buuren, & van Schie, 2011), and to promote acceptance and implementation of decisions (Bulkeley & Mol, 2003). Participation is thus assumed to lead “to a higher degree of sustainable and innovative outcomes” (Heinelt, 2002, p. 17). Many observers have argued that the success of collaborative and participatory governance will ultimately be judged by its ability to improve environmental conditions (e.g., Beierle & Cayford, 2002).

However, it is precisely the capacity to solve environmental problems that remains disputed (Dietz & Stern, 2008; Lange, Driessen, Sauer, Bornemann, & Burger, 2013; Young et al., 2013), because while collaborative governance continues to proliferate, there is still no consensus on its performance (Gerlak, Lubell, & Heikkila, 2013). Even where strong relations between collaborative processes and environmental outcomes are empirically established, it remains unclear why and how this is the case (Scott, 2015). Furthermore, competing claims as to the effectiveness of collaborative and participatory approaches pose a dilemma for “green democracy,” introducing “tension between democratic means and environmental ends” (Wong, 2015, p. 138). Different fields of study have made a variety of arguments on the pros and cons of participation with respect to environmental outcomes. The existing literature is therefore fragmented, and leaves us with logical inconsistencies. Clearly, environmental benefits of participatory decision making are not automatic, but rather are contingent on an array of intervening factors (Irvin & Stansbury, 2004).

This article seeks to move a step forward by integrating existing claims from multiple research fields on the link between participation and outcomes into a coherent framework of causal mechanisms.

We are not the first to develop a conceptual framework on participatory or collaborative governance. Ansell and Gash (2008) have put forward a literature-based model explaining the general “success” of collaboration. Emerson and Nabatchi (2015), drawing on Emerson, Nabatchi, and Balogh (2011), present a yet more general framework including the drivers, dynamics, impacts, and adaptive responses of

“collaborative governance regimes.” While building on these valuable contributions, our focus is more specific. Emerson and colleagues, in particular, study more institutionalized collaborative governance *regimes*. We theorize on public *decision making processes* (DMPs). These can be more or less participatory and collaborative. Our framework, therefore, explicitly incorporates and reflects on nonparticipatory and noncollaborative alternatives.

Decision makers are often able to choose the extent to which a DMP is going to be participatory or collaborative. Collaboration and participation, then, are a choice rather than a necessity. In this sense, we depart from Emerson and Nabatchi’s (2015) notion of collaborative governance as processes “to carry out a public purpose *that could not otherwise be accomplished*” (p. 2, emphasis added). Rather, we conceive of governance modes as strategic *interventions* that can help achieve certain goals (Scott & Thomas, 2017). The key rationale of our framework is thus to provide reasoned assumptions on which modes of governance are likely to be effective (in environmental terms) under which circumstances.

The causal framework we present comprises five clusters of core mechanisms, which address the relationship between governance modes and (i) the environmental standard of outputs, and (ii) implementation of outputs. We disaggregate these mechanisms as far as possible, to isolate causal relations between important variables in the policy process, and tease out the often implicit assumptions on which each mechanism rests. We therefore not only specify and clarify hypothesized causal mechanisms between participation and environmental outcomes, but also identify the contextual conditions under which participation may lead to better (or worse) environmental outcomes.

Our focus lies on the instrumental value of collaboration and participation in environmental governance. We acknowledge that participatory and collaborative environmental decision making may have a range of nonenvironmental outcomes that would be important to consider in gauging the overall impact of a DMP (Rogers & Weber, 2010). In this article, however, we deliberately limit our focus to the implications of decision making for the environment. We do not advance any particular “pro” or “anti” participation argument, but rather seek to examine in detail what we suggest are the most important mechanisms. The mechanisms identified and examined below have been refined from ongoing meta-analytic research examining a large body of case study evidence on collaborative and participatory environmental decision making (Newig, Adzersen, Challies, Fritsch, & Jager, 2013), and draw on a range of works from *inter alia* political science, public administration, legal studies, social psychology, environmental studies, decision science, mediation, and conflict resolution.

Examining gaps and contradictions among these mechanisms, as well as key conditioning factors, we aim to identify important variables for empirical investigation, and to integrate competing claims as to the effectiveness of collaborative and participatory environmental governance. This is useful for two reasons: First, it should provide a point of reference for future theorizing and hypothesizing. Complementary or competing hypotheses, or refined causal mechanisms, can be compared against this framework, potentially improving the conceptual basis of participatory

governance. Second, it can and should guide and organize empirical enquiry by helping to focus on relevant empirical factors for assessing participation and its outcomes in single or comparative case studies, and by guiding the interpretation of findings. Such a framework should thus aid the generation and consolidation of robust evidence on the “instrumental” value of collaborative and participatory modes of environmental governance. In contrast to recent frameworks that describe collaboration in ideal-typical terms (e.g., Emerson & Nabatchi, 2015; Emerson et al., 2011), we seek to conceptualize different dimensions of participation, and identify the precise mechanisms that link these dimensions with outcomes.

The article proceeds as follows. Section 2 presents our conceptual framework for the analysis of participatory DMPs and clarifies key terms used in the article. Section 3 presents the core mechanisms on opening up decision making, incorporation of environmentally relevant knowledge, dialogue, veto players, conflict resolution, acceptance, and capacity building for implementation and compliance, based on a thorough review of the literature. Both positive and negative mechanisms linking participation and effectiveness are elaborated. Section 4 concludes the article with reflections on the key insights gained, the potential and limitations of our framework, and future research directions.

2. Conceptual Framework and Definition of Key Terms

We consider the participation of nonstate actors in public decision making and how they interact and collaborate to reach collectively binding decisions on environmental issues. This captures a wide variety of governance modes and “degrees” of participation and collaboration in planning, licensing, rule-making, impact assessment, and other forms of public policymaking. The core concept is that of a DMP. A DMP may be initiated in a “top-down” or a “bottom-up” fashion, and may comprise a single process or several related (sub-)processes (e.g., public hearings, task forces, round tables, citizen advisory committees, etc.) that are, to a greater or lesser extent, participatory or collaborative.

“Participatory governance” and “collaborative governance” are two concepts widely addressed in the academic literature, which have much in common. An abbreviated version of Emerson and Nabatchi’s (2015) definition of collaborative governance as “processes and structures of public policy decision making and management that engage people across the boundaries of public agencies, levels of government and/or the public, private for-profit, and civic spheres to carry out a public purpose [...]” resonates with our understanding of participatory governance. Yet both concepts have their individual features. “Participatory governance”—the more widely used term in Europe¹—stresses the involvement of actors who are not normally charged with decision making. This may include formats such as public hearings or other forms of consultation that are of a non-“collaborative” nature in the stricter sense. “Collaborative governance”—more common in the North American context—emphasizes the process of working together. Both concepts, from their own perspective, entail the respective other:

From the perspective of participatory governance, collaboration is one form of interaction (out of many); from the perspective of collaborative governance, participation is one element (out of many).

Here, we consider participation as the overarching variable in DMPs. We are principally concerned with DMPs as chains of events geared toward specific outcomes, and less so with enduring collaborative regimes that typically entail iterative dynamics. Within participatory processes, collaboration features as an important category, and almost all of the studied mechanisms refer to collaborative settings. Participation is understood here as a three-dimensional concept, and can be more or less “intensive” in each of these governance dimensions (Fung, 2006; Newig & Kvarda, 2012):

1. *Breadth of involvement*: The range of stakeholders² and other actors included in the process (e.g., involvement of few selected experts, representatives of organized groups, or citizens vs. the general public).
2. *Communication and collaboration*: The manner, direction, and intensity of information flows (e.g., one-way information provision vs. collaborative development of preferences).
3. *Power delegation to participants*: The extent to which participants are afforded influence over the decisions to be taken.

Taking this into account, we define participatory governance as *processes and structures of public decision making that engage actors from the private sector, civil society, and/or the public at large, with varying degrees of communication, collaboration, and delegation of decision power to participants*.

The implication of the three-dimensional conceptualization is that these dimensions are in principle independent of each other, meaning that any given DMP can score “high” in one dimension but “low” in another. For example, there are governance modes with high levels of power delegation such as public referenda, in which collaboration is virtually absent.

The mechanisms comprising the framework relate to one or more of these dimensions treated as independent variables, which are assumed to produce social and/or environmental outcomes.³ For analytical purposes, a DMP concludes with the production of a substantive output such as a collectively binding decision or plan. The process may also generate a variety of social outcomes, depending on the nature and degree of participation and collaboration. These may include: individual and collective learning, awareness raising, acceptance of the process and output, conflict resolution and trust-building, and strengthening social capital and networks among stakeholders (Newig et al., 2013). A participatory DMP may also generate negative outcomes by, for example, eroding trust among participants and stakeholders, alienating the public, or triggering new conflicts. Ultimately, the interaction of environmental outputs and social outcomes shape the quality and extent of implementation and compliance.

The mechanisms presented in the following section are summarized in Figure 1. Following Elster (1989), we assume that “[a] mechanism provides a continuous and

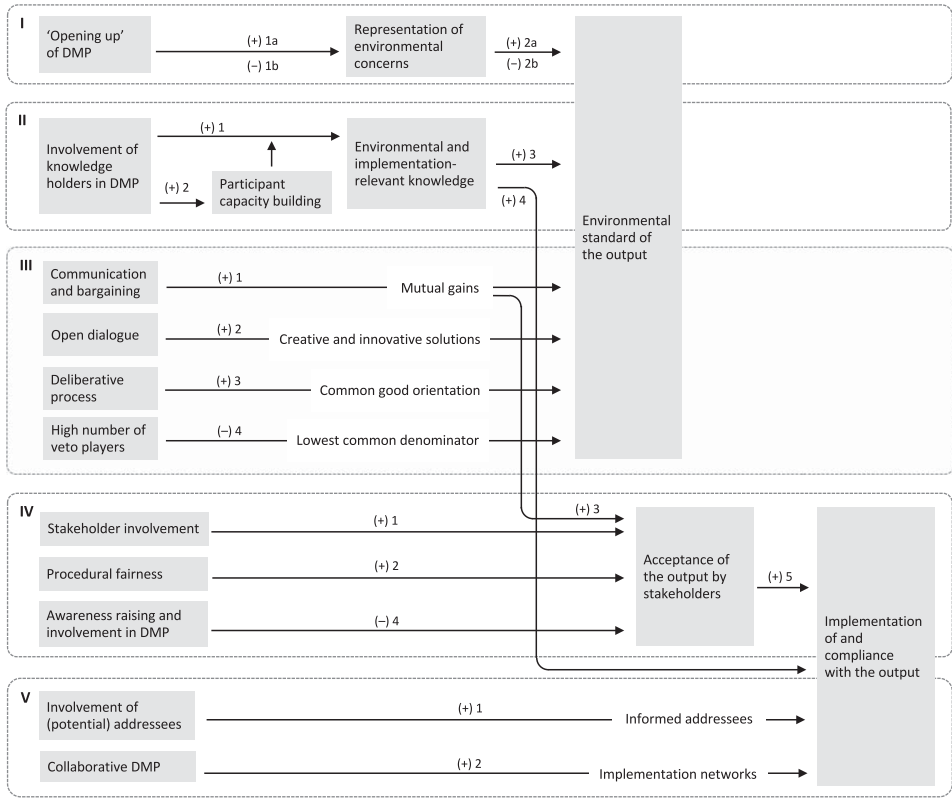


Figure 1. Overview of Mechanisms Linking Participation to Environmental and Social Outcomes. *Note:* The mechanisms are organized in clusters (Roman numerals) and individual mechanisms (Arabic numerals within clusters). Plus signs (+) denote reinforcing relationships, minus signs (-) denote weakening relationships. For example, the top left arrow combines mechanisms M I.1a (positive influence of “opening up” on representation of environmental concerns) and M I.1b (negative influence).

contiguous chain of causal or intentional links between the explanans and the explanandum” (cited in Hedström & Ylikoski, 2010, p. 51).

Mechanisms relate, first, to the link between independent and dependent variables. To aid the more precise identification of causal mechanisms, we disaggregate what often appear in the literature as complex, multistep mechanisms—or merely hypotheses linking different variables—into basic steps in a causal chain. We thus identify 19 mechanisms relating participation to outputs, and outcomes. We present these in five clusters, reflecting five fundamental ways in which participation and collaboration are assumed to affect environmental outcomes. We recognize, second, that causal relations depend not only on these mechanisms, but also on their interaction with the surrounding context. Specification of the context within which a given mechanism works is an important, yet often ignored, step in assessing its explanatory power (Falleti & Lynch, 2009), and we therefore seek to account for contextual *conditioning factors* (*sensu* Berry, Golder, & Milton, 2012) at each stage of the process, both internal and external to DMPs—that is, broadly within and beyond the control of process organizers (see Figure 2 for a schematic overview). Of the plethora of

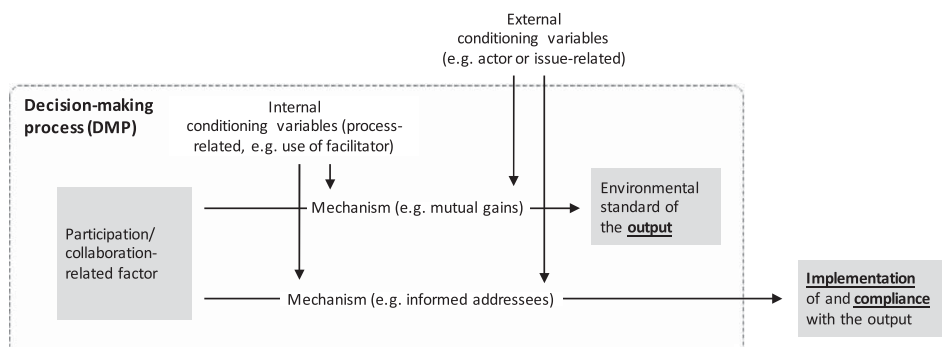


Figure 2. Schematic Depiction of Causal Mechanisms Linking Modes of Governance (Participation/Collaboration-Related Factors = Independent Variables) to Outputs and Their Implementation (= Dependent Variables).

Note: These mechanisms operate under constraining and enabling contexts termed conditioning variables, collectively discussed in more detail in Section 3. The dashed line separates the DMP from its context.

contextual variables potentially impacting environmental outcomes, we focus here on those factors likely to influence the identified mechanisms.

3. Mechanisms Linking Participation and Collaboration to Environmental Outcomes

In this main section, we outline in detail each of the mechanisms we identified, and discuss the conditioning variables that affect them.

3.1. Cluster I: Opening Up of Decision Making to Environmental Concerns

It has been widely argued that the inclusion of environmental concerns—for example, as represented by environmental NGOs and environmental administration—in participatory governance structures leads to more environmentally beneficial decisions (Dryzek, 2005; Smith, 2003). First, we consider—in two submechanisms—whether and how the opening-up of decision making to nonstate actors increases representation of environmental concerns.

1. *Opening up and the representation of environmental concerns.* Opening up decision making to actors not normally included may have substantial impacts on the representation of actors and interests, including environmental concerns:

M I.1a: Opening up a DMP to nonstate actors allows previously excluded groups, including environmental groups, to participate, thus increasing representation of environmental concerns in a DMP.

M I.1b: Opening up a DMP to nonstate actors decreases representation of environmental concerns.

Conventional public environmental DMPs “often fail to incorporate the whole range of environmental values” (Smith, 2003, p. 129). Opening up a DMP can create

opportunities for greater representation of a broader range of stakeholders from many—often underrepresented or marginalized—sectors of society (Fung, 2006). Hence, such representation may significantly alter the distribution of actors and interests involved. Arguably, environmental groups and other actors motivated by environmental concerns will have a strong incentive to participate in a DMP affecting environmental matters, and thus be rather strongly represented (Larson & Lach, 2008). Paradoxically, opening-up decision making in this way could also weaken the position of environmental concerns, as potentially opposing concerns might dominate.

Whether or not a participatory process substantially increases the representation of environmental concerns (M I.1a vs. M I.1b) depends on both the potential participants, and how the process is designed.

- *Stakeholders' environmental orientation*: Depending on the issue and the scope of the DMP, stakeholders may be more or less strongly oriented toward the environment (Fung, 2006; Larson & Lach, 2008; Newig & Fritsch, 2009). This may depend *inter alia* on the spatial scale of decision making. Decisions at the local level tend to be biased toward economic development at the expense of environmental values (Irvin & Stansbury, 2004; Koontz, 1999; Layzer, 2002).
- *Willingness to participate*: Stakeholders' willingness to participate varies (Newig, 2007). Actors weigh up expected costs and benefits of participation, considering the likelihood of their influencing the decision (Turner & Weninger, 2005). This is particularly true for environmental groups that have to gain or maintain credibility (Holzinger, 2000; Whelan & Lyons, 2005). Further, actors tend not to participate when they perceive their concerns to be already sufficiently represented (Diduck & Sinclair, 2002), or when they anticipate manipulation by more powerful participants (Purdy, 2012).
- *Stakeholder capacity*: Well-resourced actors are more able and more likely to participate (Diduck & Sinclair, 2002; Fung, 2006; Fung & Wright, 2001). Environmental groups tend to have comparatively few resources at their disposal (Ansell & Gash, 2008; Layzer, 2002), often working on a voluntary or nonprofit basis. Where meetings and other participation events are held during work hours, and where attendance necessitates travel, the costs, especially to small, nonprofessionalized, and local environmental groups, are relatively high. Access to resources and capacity to meaningfully participate is often related to geographical scale: Stakeholder representatives at regional or national levels are usually selected on competency-based criteria, and have access to more professional resources than their counterparts at local levels of governance (Rockloff & Moore, 2006).
- *Open versus inclusive process*: The aforementioned stakeholder-related factors cannot be considered in isolation from the participatory process design. It makes a difference whether a DMP is "open" (to everyone), relying essentially on self-recruitment of participants, or whether it is "inclusive" in that the organizers deliberately follow strategies to invite and introduce certain stakeholders to the

process, aiming for a balanced and representative group (Fung, 2006). Targeted stakeholder selection helps to offset underrepresentation of environmental concerns, as can the use of positive incentives, the reimbursement of attendance costs, and the choice of appropriate process timeframes and meeting locations (Johnston, Hicks, Nan, & Auer, 2011).

To sum up, a participatory process is more likely to lead to stronger representation of environmental concerns when stakeholders show a strong environmental orientation and a strong tendency to participate (M I.1a). Completely open processes are prone to suffer from imbalances of participants, making underrepresentation of environmental concerns more likely (M I.1b). Processes employing specific measures to target and support otherwise under-resourced stakeholder groups potentially contribute to strong representation of environmental concerns.

2. *Representation of environmental concerns and environmental quality of decisions.* A second pair of mechanisms addresses the extent to which the inclusion of environmental concerns impacts positively or negatively on the environmental quality of decisions:

M I.2a: Increased representation of environmental concerns in a DMP fosters environmental advocacy, impacting positively on the environmental quality of the output.

M I.2b: Increased representation of environmental concerns in a DMP weakens the position of environmental groups vis-à-vis more powerful actors, impacting negatively on the environmental quality of the output.

M I.2a assumes that environmental actors, by participating in a DMP, have better chances to advocate for their concerns than if they were not involved. The particular values, arguments, and knowledge (see cluster II) brought to the table by proponents of environmental interests can enhance the environmental quality of outputs (Brody, 2003). This may happen by convincing other actors and coalitions engaged in the process.

M I.2b, by contrast, argues first that in participatory processes, environmental groups may be co-opted by more powerful actors. The cordial relationships often developed among parties in collaborative processes may lead to greater concessions on the part of environmental groups (“pacification” or “seduction”) (Amy, 1987). The obligation for participants to engage “reasonably” can stifle expressions of objection and frustration, which may be seen as counterproductive and nonconstructive. In this way, participation can serve to suppress and dilute the concerns and convictions that environmental groups bring to the table. Second, environmental groups may be deprived of other, more effective ways to pursue environmental concerns (Berry, 1981). By taking part in a DMP—or choosing to “play the consensus game” (Whelan & Lyons, 2005)—groups may lose recourse to means of challenging power from outside of participatory settings, such as lawsuits, protest, or direct action. This may result in an overall loss of influence for environmental groups (Ansell & Gash, 2008; Bulkeley & Mol, 2003; Fung & Wright, 2001). Indeed, under some circumstances effective influence may only be possible in confrontation with authorities (Whelan & Lyons, 2005).

What determines whether representation of environmental concerns in a DMP improves or weakens the environmental quality of a decision, and whether actors pursuing environmental goals are able to effectively influence decisions in collaborative settings?

- *Process characteristics*: Professional facilitation or mediation, along with clear rules and procedures, can help overcome power imbalances and avoid co-optation of (environmental) groups (Amy, 1987; Cooke, 2001).
- *Trust among participants*: Co-optation is more likely to occur in trustful settings. Conversely, where distrust prevails, participants may be viewed by their adversaries as more powerful than they actually are (see Leach & Sabatier, 2005, on “devil-shift”).
- *Participant characteristics*: Participants may be more or less prone to co-optation and devil-shift. This likely depends on actors’ political, legal, and technical resources (Ley & Weber, 2015). Stakeholders will decide strategically whether to participate and focus their skills and resources in a given process, or to pursue their interests in alternative venues with greater perceived benefits (Lubell, 2013; Sabatier & Jenkins-Smith, 1999). Some actors, however, do not have full knowledge of the alternatives open to them (Holzinger, 2000), let alone of those open to other actors, which can lead actors to stay in the process at the risk of being co-opted. Further, environmental stakeholders may possess fewer resources for “outside process” campaigns such as litigation or organizing public protests (Whelan & Lyons, 2005).

3.2. Cluster II: Incorporation of Environmentally Relevant Knowledge

A second strand of thinking builds on the assumption that participation strengthens the knowledge base of decisions through incorporating different kinds of (e.g., local and/or lay) knowledge that are relevant to understanding and addressing the environmental problem at hand, thereby enhancing environmental policy outputs and their implementability (Beierle & Cayford, 2002; Fazey et al., 2013; Fischer, 2000; Fung, 2006; Ostrom, 1990; Ulibarri, 2015).

1. *Relevance of lay and local knowledge for decision making*

M II.1: Involving actors directly occupied with the environmental issues at hand in decision making, leads to a higher degree of environmentally relevant knowledge and knowledge relevant for implementation being made available to the DMP.

As Smith (2003, p. 62) notes: “Too often, decision makers [...] are far removed from the impact of their decisions, and the experiences, knowledge and perspectives of those whose practices are more attuned to the change in ecosystems are not articulated.” Involving stakeholders in decision making may improve the information base in different ways, depending on the nature of both the uncertainties at

issue, and the relevance of the knowledge held by stakeholders for addressing the problem at hand.

Stakeholders—or “knowledge holders” (Schmitter, 2002)—may hold local knowledge that is more accurate than knowledge normally available to decision makers. Scientific models may simply be wrong or inadequate if they fail to take account of local conditions (Fischer, 2000; Wynne, 1992). Further, local actors may have specific knowledge that can complement existing models (i.e., specialist knowledge, Wynne, 1992).

Through participatory processes, authorities may also gain insights into the social context within which measures will be implemented. For example, officials may learn whether and how stakeholders communicate and interact, what local norms and customs prevail, what competing stakes exist, and what the social “costs” of implementation might be. In this way, authorities may better anticipate the extent of local acceptance of proposed measures (van Asselt & Rotmans, 2002), and thereby learn about the likelihood of implementation and compliance (Newig, Pahl-Wostl, & Sigel, 2005).

Conditioning factors for M II.1 include:

- *Knowledge deficit (decision maker)*: As stated above, a certain lack of knowledge on the part of decision makers is an obvious precondition (Hurlbert & Gupta, 2015). This, however, may not be easily recognized in practice. Decision makers may not perceive a knowledge deficit, whereas in reality stakeholders could actually contribute relevant and valuable knowledge to inform decision making.
- *Knowledgeable stakeholders*: To contribute meaningfully, stakeholders must be sufficiently knowledgeable (Geissel, 2009). Therefore, if knowledge input is important to the process, then those stakeholders who are likely to provide this knowledge should be invited to participate. This may require tailoring the spatial scale of a DMP to that of the issue at stake. Involving a diversity of participants is expected to increase the potential of meaningful contributions (Emerson et al., 2011). Below (2) we discuss how in a longer participatory process, participants can be educated and empowered to be able to contribute more meaningfully.
- *Structured knowledge integration*: The process ought to facilitate knowledge exchange and input by participants. Structured methods to achieve this include individual interviews, participatory modeling (Renn, 2006; Rowe & Frewer, 2005), transactive memory systems (Heikkilä & Gerlak, 2013), and methods that translate between “lay” and “expert” types of knowledge (Edelenbos et al., 2011).

2. *Education and empowerment of participants for more meaningful participation*. Meaningful public input does not occur automatically, but often presupposes capacity building among participants. This can happen during a participatory process, where information exchange informs and empowers participants, increasing their ability to provide constructive, environmentally relevant input.

M II.2: Participation improves participants’ understanding of the issues at hand, increasing the likelihood of their providing constructive, environmentally relevant input.

As Beierle and Cayford (2002, p. 15) assert, “[i]ncreasing public understanding of environmental problems builds capacity for solving those problems [...] and] to formulate alternatives.” Laird (1993) argues that participation can empower participants by improving their understanding and capacity to analyze an issue. Thus, in a collaborative setting, “participants must generate enhanced or new capacities for joint action that did not previously exist” (Emerson & Nabatchi, 2015).

For capacity building among participants, communication must allow for two-way information flow. The extent to which participation and collaboration improve participants’ knowledge and capacity depends on several factors:

- *Knowledge deficit (participants)*: A precondition for this mechanism is that participants are not already sufficiently knowledgeable, which is typically the case in “technically intensive” issues (Laird, 1993). While this may seem obvious, it means that there will be relatively straightforward issues where participant capacity building is simply unnecessary.
- *Engaged participants*: Participants must be interested in the subject, willing to listen, and prepared to engage with the perspective of the administration. This may be lacking in highly conflictual situations where levels of trust are low (Heikkilä & Gerlak, 2013). Conversely, participants should critically engage with expert knowledge and advice in “their efforts to form their own view on the issue under consideration” (Laird, 1993, p. 354).
- *Understandable and unbiased information*: Information provided by the organizers must be comprehensive and understandable for interested lay stakeholders. Where information is skewed or biased, or certain views or community sectors are over-represented, uptake of information by participants is likely to be impaired (Coenen, 2008).

3. *Knowledge and environmental outputs*. Assuming that participation does make relevant knowledge available to environmental DMPs, and that interaction in participatory settings can foster this by informing and empowering stakeholders, it is further argued that:

M II.3: A higher degree of environmentally relevant knowledge made available to a DMP leads to higher environmental standards of the output.

However, the fact that knowledge is contributed does not imply it will automatically inform a decision. First, knowledge may be framed and interpreted differently by various actors, as has been highlighted repeatedly (for a recent overview, see Heikkilä & Gerlak, 2013). To inform decision making, knowledge needs to be framed and seen as useful to this end. Second, public decision making is a political process shaped by interests and power, as discussed in cluster I above. Political will to draw on knowledge made available during a DMP—both by decision makers and by interested stakeholders—is thus a precondition, notably with regard to the formal decision-making stage following a participatory format (Flynn, 2008).

4. *Knowledge and implementation.* In addition to improving outputs, stakeholder knowledge harnessed or generated in participatory processes may also improve implementation.

M II.4: Environmentally relevant and implementation-relevant knowledge included in a decision makes implementation of the decision more likely.

The key idea is that an output that builds on the practical knowledge and experience of stakeholders, and thereby targets solutions that are accepted by implementing actors, is more likely to be implemented than one that lacks this kind of grounding in (local) knowledge (Ulibarri, 2015). Whether or not implementation *actually* happens depends on multiple factors, which are addressed in more detail in M IV.5 below (e.g., acceptance by implementers and decision makers).

3.3. Cluster III: Group Interaction, Learning, and Mutual Benefits

Participation as reflected in mechanism clusters I and II above can be thought of as “additively” valuable in that decision making profits from inputs (e.g., environmental concerns, or environmentally relevant knowledge). However, participation can also be “multiplicatively” valuable in that the *interaction* of participants yields solutions that “would not have occurred to the participants individually” (Smith, 2003, p. 62). We identify mechanisms capturing the effects of different kinds of dialogic processes (negotiation, open dialogue, deliberation, and consensus seeking), the types of solutions they can produce (mutual gains, innovation, and common good orientation) and their environmental implications, both positive and negative.

1. *Negotiation and mutual gains for environmentally beneficial outputs.* The first mechanism in this cluster asserts that negotiation—underpinned by communication and bargaining—allows for the identification of positive-sum solutions. Compared to a non-negotiated outcome, a positive-sum (“win-win”) solution represents an improved allocation of the resources at stake in a DMP, so that all or many affected interests benefit, including the environment (Brody, 2003).

M III.1: A DMP characterized by a higher degree of communication and bargaining is more likely to lead to the identification of mutual gains than a DMP with little or no communication and bargaining.

This refers to a form of dialogue that—in contrast to more restricted participation modes such as petitions or public hearings—is communication intensive (Beierle & Cayford, 2002; Susskind, Levy, & Thomas-Larmer, 2000). Intensive face-to-face dialogue (Ansell & Gash, 2008; Delli Carpini, Cook, & Jacobs, 2004) creates conditions under which negotiating parties discover in an active manner each other’s perspectives, capabilities, needs, and preferences (Emerson & Nabatchi, 2015). Consequently, participants will be more likely to arrive at a solution that increases mutual gains (Ansell & Gash, 2008). Compared to deliberative processes,

discussed below, negotiation is less ambitious, and parties need not develop a common value basis or shared purpose, but rather pursue their own self-interest.

The basic premise for negotiation to happen is that participants' exit options are not preferable to negotiation (cf. the discussion in I.2). Whether or not a participatory process involving negotiation will produce mutual gains depends on procedural fairness, potentially through professional facilitation (Susskind, McKearnan, & Thomas-Larmer, 1999). Identifying mutual gains likely increases chances that the environment will also benefit, but this also depends on the representation of environmental concerns in the DMP (cluster I).

2. *Open dialogue, innovation and learning for environmentally beneficial outputs.* Beyond securing mutual gains, dialogue may foster innovation beneficial to the environment.

M III.2: A participatory DMP characterized by open dialogue more likely leads to the development of creative and innovative solutions to environmental problems than one without open dialogue.

Interaction and dialogue among diverse participants potentially produces innovative results through the exchange of different perspectives, information, and knowledge conducive to mutual learning (Fazey et al., 2013; Heikkilä & Gerlak, 2013). Learning by individuals and/or groups of participants may imply improved understanding of other participants' perspectives and the problem at hand, and/or transformation of views and values via critical reflection (Connick & Innes, 2003; Emerson & Nabatchi, 2015). Innovation and win-win solutions often go hand-in-hand, and through learning and developing new ways of thinking, long-term impasses can be overcome (cf. examples in Connick & Innes, 2003). Exchanging perspectives and knowledge of different types appears to be particularly beneficial in situations of radical uncertainty, where problems are characterized by indeterminacy, complexity, or incommensurability (Ansell, 2016; Pellizzoni, 2003).

As the mechanisms underlying innovation are centered on knowledge and learning, the same conditioning factors as discussed for M II.1 to M II.3 apply. Apart from process design that allows for open and fair dialogue, high levels of trust and a shared sense of purpose among participants provide favorable conditions for positive outcomes (Connick & Innes, 2003; Heikkilä & Gerlak, 2013; Oh & Bush, 2014). Facilitation is held to be conducive to effective knowledge exchange, and to compensate for strategic behavior (Fazey et al., 2013).

3. *Deliberation and environmentally beneficial outputs.* Possibly the most promising—but also the most demanding—mechanism of dialogical processes is deliberation. While many scholars understand deliberation as encompassing interaction forms such as open dialogue and negotiation (e.g., Smith, 2003), we use it here in a more narrow, Habermasian sense in order to more clearly distinguish the different mechanisms.

M III.3: A deliberative participatory process setting is more likely to produce an orientation of participants' views toward the common good, and therefore more likely to produce outputs more favorable to the environment, than a nondeliberative DMP.

A deliberative setting is characterized by “candid and reasoned communication and information exchange that is structured and oriented toward problem solving” (Emerson & Nabatchi, 2015), as opposed to mere bargaining or negotiation (Elster, 2000). It is undistorted by power play, transparent, and fair, based on clear rules that enable unimpeded dialogue (e.g., through professional facilitation), and characterized by a trustful atmosphere (Ansell & Gash, 2008; Emerson & Nabatchi, 2015; Innes & Booher, 1999; Smith, 2003). The dialogue is conducive to following the most “reasonable” argument in the Habermasian sense (Fung & Wright, 2001; Webler & Tuler, 2000).

These process factors are expected to lead to a common good orientation of the discourse, characterized by “preferences and justifications which are ‘public-spirited’ in nature [because] preferences held on purely self-interested grounds become difficult to defend in a deliberative context” (Smith, 2003, p. 63). A deliberative setting is expected to “transform initial policy preferences (which may be based on private interest [...], prejudice and so on) into ethical judgements on the matter in hand” (Miller, 1992, p. 62) and toward an output that secures benefits for all parties and the environment (Aldred & Jacobs, 2000). This distinguishes deliberation from the other mechanisms described in this cluster.

The quality of deliberation and its outcomes depends on the provision of a safe and protected space for participants, where they can speak freely and exchange in a meaningful way (Birnbbaum, 2016; Emerson & Nabatchi, 2015). This includes strategies for accommodating pronounced power imbalances (Choi & Robertson, 2014; Selin & Chavez, 1995).

Whether or not the environment profits from deliberation may depend on the extent to which an environmental issue actually is a “common good” issue (as opposed to affecting a particular group of individuals).

4. *Veto players and consensus at the lowest common denominator.* On the downside of participatory group interaction, there is a danger that participation hampers agreement in decision making. Particularly (but not exclusively) in processes striving for consensus, the participation of a large number of actors who can potentially veto a decision may be detrimental to achieving public-good-oriented solutions.

M III.4: The more veto players involved in a DMP, the more likely the output will have lower environmental standards.

A veto player is “an individual or collective actor whose agreement is required for a policy decision” (Tsebelis, 1995, p. 293). In the context of environmental governance, it has been claimed that with an increasing number of veto players, dramatic changes of the *status quo* are less likely, with solutions instead being based on the

lowest common denominator, with negative consequences for the environmental standard of outputs (Brandt & Svendsen, 2013; Brody, 2003; Layzer, 2008; Tsebelis, 1995). Whether or not this occurs likely depends on:

- *Mode of decision making*: Where consensus is not necessary, fewer veto positions exist.
- *Degree of conflict*: The further the positions of participants differ, the less scope for negotiation, and the more likely that solutions will emerge at the lowest common denominator (Tsebelis, 1995). Consequently, planners aiming to arrive at implementable solutions try to enlarge negotiation space from the outset.
- *Participants' willingness and ability to cooperate*: This applies both to the attitude of participants in general, and to the leeway that representatives of organizational actors have to negotiate in a DMP (Tsebelis, 1995).

3.4. Cluster IV: Acceptance and Conflict Resolution for Implementation

A fourth main function of participation and collaboration is to foster the *acceptance* of decisions, with a view to better compliance and implementation (Birnbaum, 2016; Bulkeley & Mol, 2003). We distinguish between *implementation* as "actions by public and private individuals (or groups) that are directed at the achievement of objectives set forth in prior policy decisions," including "one-time efforts to transform decisions into operational terms, as well as continuing efforts to achieve the large and small changes mandated by policy decisions" (van Meter & van Horn, 1975, p. 447); and *compliance* as "the specific obedience or lack thereof to a law or directive" (van Meter & van Horn, 1975, p. 454).⁴

Arguably, acceptance is crucial for effective governance, because outputs with a high environmental standard on paper but little acceptance by addressees and implementers are likely to remain symbolic and ineffective, if implementation cannot be centrally monitored and enforced (Ulibarri, 2015). Different types of environmental decisions, however, rely on different implementation activities and/or compliance by specific actor groups.

1. *Accommodation of interests*. The most straightforward mechanism in this cluster assumes that in an inclusive, participatory process, acceptance may develop due to a sense of "decision ownership," if the output reflects participants' concerns (Brody, 2003; Chess & Purcell, 1999; Newig, 2012):

M IV.1: A higher degree of participation leads to the accommodation of more diverse interests in the output, which increases acceptance by stakeholders.

This requires meaningful contributions from participants, and the willingness of authorities to consider participants' interests in a final decision (Edelenbos et al., 2011). Representatives must be perceived as legitimate spokespersons by affected stakeholders (Brody, 2003; Newig, 2012). Likewise, the exclusion of

important groups with means to oppose the implementation of a decision (e.g., through legal challenges) bears the danger of nonacceptance (Layzer, 2002).

2. *Procedural fairness.* “No matter how good an agreement is by some standards, if it was reached by a process that was not regarded as fair, open, inclusive, accountable, or otherwise legitimate, it is unlikely to receive support” (Innes & Booher, 1999, p. 415). Expressed positively, we suggest that:

M IV.2: A DMP that is perceived as fair and legitimate is likely to be accepted by participants, their respective constituencies, and other stakeholders.

If stakeholders believe that a process was run fairly, and they trust in the purpose of the process, they are more likely to accept the final decision and other outcomes of the process (Susskind & Cruikshank, 1987; Webler & Tuler, 2000). A strong sense of procedural justice among stakeholders can even increase acceptance of decisions that do not reflect the substantive interests of all stakeholders (Lind & Tyler, 1988; Wondollock & Yaffee, 2000).

Characteristics of a fair and just process include:

- Early and meaningful involvement for those directly participating—that is, fair representation (Newig, 2007; Webler & Tuler, 2006) and no foregone conclusions (Diduck & Sinclair, 2002; Newig, 2012).
- A certain level of trust on the part of stakeholders in the intentions of the process organizers and institutions (Webler & Tuler, 2000) and, on the part of the organizers, unbiased enforcement of rules and standards (Birnbaum, 2016).
- Within-process communication that permits participants to express their views: “Citizens value opportunities to speak, whether or not this voice is linked to influence over the decisions made by the political body” (Lind & Tyler, 1988, p. 170).
- Mediation, if needed, should be impartial (Webler & Tuler, 2000).
- For stakeholders outside of the immediate process, perceptions of fairness may rely on transparency (Reed, 2008) and accountability (Webler & Tuler, 2000, 2006).

Note that these process characteristics bear resemblance to those required for deliberation and open dialogue. Yet while deliberation requires a collaborative setting, a fair and legitimate process likely to produce acceptance is less demanding in terms of the quality of participant exchange.

3. *Negotiation, mutual gains, and conflict resolution for acceptance.* A third route to acceptance is via outputs that make more stakeholders better-off. Processes that produce such positive-sum solutions (as discussed in mechanism III.1) may involve the successful resolution of conflicts.

M IV.3: Mutual gains and conflict resolution resulting from negotiation increase stakeholders' acceptance of the output.

While a solution assuring mutual gains may be more acceptable to negotiating parties (Susskind et al., 1999), the extent to which it is more widely accepted—for example, by stakeholders and the public at large—depends on negotiating parties' representativeness of their wider constituencies (Elster, 2000).

In the case of value conflicts, especially where actors hold strongly opposing values, conflict resolution can be difficult. However, skilled facilitators or mediators may be able to bring initially adversarial parties together, establishing and maintaining ground-rules for negotiation (Leach & Pelkey, 2001), and ensuring fairness. The extent to which a given consensus or resolution is accepted in the longer run, and by stakeholders and addressees beyond the immediate participants, is likely to depend on those factors at work in conjunction with the generation of acceptance more generally (see M IV.1).

4. *Waking sleeping dogs.*

M IV.4: Raising stakeholders' awareness of issues, and their involvement in decision making, leads them to consider possible negative effects of decisions and thus increases opposition to environmentally beneficial measures.

In addition to resolving conflicts, participation can also (i) introduce conflict over who counts as a legitimate participant; and (ii) fuel conflict by heightening stakeholder sensitivities to adverse aspects or implications of a decision (Coglianese, 1997; Rose-Ackerman, 1994). Participants "may also find that the more time they invest in a rulemaking proceeding, the less willing they are to overlook imperfections of the rule" (Coglianese, 1997, pp. 1326–27).

In light of these effects, the promise of participation can lead to unrealistic expectations among stakeholders as to what a participatory process can accomplish (Coglianese, 1997). Whether participation actually increases conflict or opposition to a decision depends in part on the interests at stake. The more stakeholders have a (potentially) high stake in the issue, and the more pronounced the conflicts among stakeholders, the more likely this mechanism is to operate. Careful stakeholder analysis may help avoid conflict via the first sub-mechanism by ensuring that no potential veto players are left out of the process. The second submechanism is likely to be more important where environmental issues remain relatively obscure and have not been widely publicly debated.

5. *Acceptance for implementation and compliance.* Ultimately, acceptance of environmental decisions, generated through participatory and collaborative processes, is expected to foster implementation and compliance, thus strengthening environmental performance (Stave, 2002):

M IV.5: The greater the degree of acceptance by stakeholders, the higher the likelihood of implementation and compliance.

This may happen through (i) reduction of opposition to outputs, and (ii) generation of support for outputs. The former argument, commonly found in the consensus building and conflict resolution literatures, holds that acceptance

generated in a participatory process (e.g., via negotiation, positive-sum effects, procedural justice) reduces opposition to the output (e.g., through litigation) and potential noncompliance, thereby facilitating implementation (Bulkeley & Mol, 2003; Innes & Booher, 1999; Susskind & Cruikshank, 1987).

The latter argument links acceptance to stakeholders' increased willingness to (co-)implement and voluntarily comply with outputs. In this sense, acceptance actively and positively motivates stakeholders (Coenen, 2008; Layzer, 2002). This assumes that stakeholders are addressees or potential co-deliverers of a given decision, or perform some other function in implementation.

As Beierle and Cayford (2002) warn, the link between participation and implementation should not be taken for granted. A number of factors can have a significant influence:

- Even where a participatory process produces agreement on goals and objectives, disagreement can arise over implementation, which can be delayed or stalled;
- If a DMP has excluded important actors—for example, politicians and bureaucrats, private sector actors—implementation may be hampered by those groups (see also M III.4);
- As there may be a considerable time lag between decision making and implementation, circumstances may change such that implementation as initially envisaged becomes infeasible or undesirable.

3.5. Cluster V: Capacity Building for Implementation and Compliance

Participatory governance can provide decision makers and participants with information and build individual and collective capacities that aid implementation and compliance.

1. *Informing policy addressees.*

M V.1: Participation of policy addressees in decision making improves implementation and compliance.

Involving those state and nonstate actors who will be responsible for implementing and/or complying with an output informs them and increases their capacity to act, adapt, and behave in ways conducive to implementation and compliance (Brody, 2003; Innes & Booher, 2004; Newig, 2007). Through involvement in the DMP, policy addressees become more informed on the issue at hand (Koontz & Thomas, 2006; Pellizzoni, 2003) and become alerted to opportunities for voluntary action (Campbell, Koontz, & Bonnell, 2011).

Arguably, various process characteristics will influence the uptake of information by participants; these have been described in the context of M II.2 above.

Of further relevance are the conditioning factors mentioned in M IV.5 that affect whether or not actors are likely to engage in or facilitate implementation.

2. *Networks for implementation.*

M V.2: Participation fosters the formation or strengthening of networks among participants, which leads to improved implementation and compliance.

Intensive communication and repeated interaction in participatory DMPs likely result in more frequent, and perhaps also more selective, relationships with other actors. Once these relationships become more stable (typically outlasting the original DMP), we may speak of governance networks (Poocharoen & Ting, 2015). Either new networks are formed, or pre-existing networks may be strengthened, thus facilitating joint action. It is assumed that participants come to recognize that others have important knowledge and capacities, or common interests (Layzer, 2008; Oh & Bush, 2014), which helps to build shared motivation for joint action (Emerson & Nabatchi, 2015; Innes & Booher, 2004; Sayles & Baggio, 2017).

Networks of stakeholders potentially mobilize collectively held knowledge and capacities in ways that are appropriate to and supportive of implementation (Weible & Sabatier, 2005). First, the sense of common purpose and shared motivation (Emerson & Nabatchi, 2015) that underpins network development increases the potential of collective action (Poocharoen & Ting, 2015). Second, networks can aid mutual monitoring and social control, thus fostering the detection of noncompliance (Leach & Pelkey, 2001; Ostrom, 1990).

The formation and efficacy of such relationships and networks depend on a range of factors. Actors' becoming part of a network in the first place depends on the incentive structures a process provides, as well as actors' motivation and goals (Lubell, 2013). For organizers, this means that attention must be paid to the costs of participating, taking into account existing ties among actors, while stakeholders need to recognize their mutual compatibility and the benefits of resources exchange (Booher & Innes, 2002; Rhodes, 2008). How far networks aid implementation and compliance may depend on the structure of the network. For example, dense networks are expected to be more conducive to collective action, because they better facilitate resource and information exchange (Emerson & Nabatchi, 2015; Poocharoen & Ting, 2015).

4. Discussion and Conclusion

Table 1 summarizes all 19 mechanisms and specifies the conditioning variables associated with the dependent and independent variables. Independent variables are defined as the central features of a (participatory) process. These embody variations of the governance dimensions developed in section 2 (breadth of involvement, communication and collaboration, power delegation). Conditioning variables, which impact on the relation between dependent and independent variables, may be associated with the external context in which DMPs take place, or with factors internal to a DMP, relating to the design and functioning of processes themselves. From the

viewpoint of a process organizer, *external factors* can in principle be taken as given, determining the scope of possible process design options. For example, if process organizers are aware of knowledge deficits on the part of stakeholders (external factors), they are in a position to choose an appropriate process design (M II.2) in order to deal with this challenge. *Internal factors* represent the particular process specifications of a mechanism (e.g., facilitation or early involvement). Internal conditioning variables bear resemblance to independent variables, as both are under the control of the process organizer. However, independent variables refer to the general mode of governance (more or less participatory and/or collaborative in three dimensions), whereas internal conditioning variables specify the process-related conditions under which a particular mode of governance is likely to be effective with regard to a particular mechanism.

Many conditioning factors are repeatedly mentioned (e.g., process facilitation, trust-building, not excluding important groups, stakeholders' environmental orientation). While this highlights the relative importance of these factors, it does not mean that these are universally important "success factors" for participatory processes.

Generally, it must be emphasized that despite the analytical stance we have taken here, these mechanisms will not occur in isolation in a given decision-making setting, but are often closely interrelated. In particular, mechanisms that rely on the same independent and conditioning variables are likely to occur in conjunction. For example, deliberation may enhance the environmental quality of a political decision (M III.3), while at the same time its structural features of discursive fairness are beneficial for gaining acceptance among stakeholders and the public (M IV.2) and, ultimately, fostering implementation and compliance. From a process-organizer perspective, this implies opportunities but also challenges. For example, intensive face-to-face interaction may both enable social learning (cluster III), and foster networks for implementation (cluster V). Conversely, involving stakeholders in decision making may entail many "positive" effects for environmental outputs (cluster I in particular), but also "wake sleeping dogs" (M IV.5).

While this article has focused on the instrumental value of participation for the environment, we find that many of the independent and conditioning variables relate to aspects of democratic legitimacy, such as access to decision making, balanced representation, and procedural fairness. This supports the argument that democratic legitimacy and effectiveness are in many ways closely related in participatory public environmental decision making.

We have illustrated how unpacking and disaggregating competing claims allows for a more precise identification of the opposing mechanisms that underpin these claims as well as the relevant conditioning factors that separate them. Together, these steps can help take us beyond generalizations about the effectiveness (or lack thereof) of participatory governance, while also illuminating specific contextual factors that help explain contradictory claims.

We see at least three areas for further research, which at the same time demarcate both the potential and the limitations of this study.

Table 1. Overview of Mechanisms Including Contextual (Conditioning) Variables

Mechanism	Independent Variables (Feature of Participation)	Dependent Variables (Results)	Conditioning Variables	
			Internal to the DMP	External to the DMP
Cluster I—Opening up of decision making to environmental concerns				
1a. Access for environmental concerns	Opening up decision making for groups typically outside the policy process	Strong (a) versus weak (b) representation of environmental concerns	Targeted recruitment, balanced representation of stakeholders	Environmental orientation of stakeholders, willingness, and capacity to participate
1b. Dominance of nonenvironmental concerns	Representation of environmental concerns in collaborative (2b) DMP	Strong (a) versus weak (b) environmental output	Facilitation or mediation; trust-building	Environmental groups' susceptibility to co-optation
2a. Advocacy of environmental concerns				
2b. Co-optation of environmental groups				
Cluster II—Incorporation of environmentally relevant knowledge				
1. Harnessing lay/local environmental knowledge for decision making	Involving a variety of issue-related stakeholders in a DMP	Additional knowledge relevant to the DMP and implementation	Structured knowledge integration	Knowledge deficit among decision makers; knowledgeable stakeholders
2. Education and empowerment of participants for meaningful participation	Stakeholder involvement in DMP	Empowered and knowledgeable participants	Clear, understandable information; trust-building	Engaged stakeholders but with knowledge deficits; trust in authorities
3. Sound information basis for environmentally appropriate decision making	Environmental knowledge available to DMP	Strong environmental output	Framing of knowledge as useful	Political will and commitment; stakeholder interests
4. Knowledge fosters the implementability of decisions	DMP includes environmental and implementation-relevant knowledge	Implementation of decision	Lasting conflict resolution; no important groups excluded	Participants charged with implementation; participant capacities
Cluster III—Group interaction, learning, and mutual benefits				
1. Negotiation and bargaining for mutual gains	Communication intensive DMP	Strong environmental output	Facilitation, representation of environmental concerns	Capacities and relative exit options of participants
2. Group innovation and learning	DMP with open dialogue; group interaction	Innovative solutions benefiting strong environmental output	Facilitation, shared sense of purpose, trust-building	Complex problem setting; competent and open-minded participants
3. Deliberation and common good orientation of participants	Deliberative setting	Strong environmental output	Protected space: trust-building, fair, and transparent process	Competent participants; low conflict and power imbalance

Table 1. *cont.*

Mechanism	Independent Variables (Feature of Participation)	Dependent Variables (Results)	Conditioning Variables	
			Internal to the DMP	External to the DMP
4. Consensus at lowest common denominator	Number of veto players involved in DMP	Weak environmental output	Decision mode	Degree of conflict; narrow negotiation space
<i>Cluster IV—Acceptance and conflict resolution for implementation</i>				
1. Accommodation of participant interests	Stakeholder involvement; power delegation	Acceptance of output by stakeholders	Access of important groups	Participants are legitimate representatives
2. Acceptance through procedural fairness	Fair, inclusive, or accountable, or otherwise legitimate DMP	Acceptance of output by participants and other stakeholders	Early involvement, transparency, facilitation	Trust in authorities
3. Negotiation, mutual gains, and conflict resolution for acceptance	DMP that produces mutual gains and resolves conflicts	Acceptance of output by stakeholders	Facilitation and mediation; no important groups excluded	Participants are legitimate representatives
4. "Waking sleeping dogs": Stakeholders become aware of a decision's negative aspects	Stakeholder awareness raising and involvement in decision making	Increased controversy and opposition to environmental outputs	Excluding important stakeholders; raising unrealistic expectations	Diverse stakeholders with high and conflicting stakes; issue salience
5. Acceptance for implementation and compliance	Acceptance of output by stakeholders	Implementation of and compliance with output	Lasting conflict resolution; no important groups excluded	Participants charged with implementation; participant capacities
<i>Cluster V—Capacity building and implementation and compliance</i>				
1. Potential addressees are informed of upcoming obligations	Early participation of policy addressees	Implementation of and compliance with output	Clear, understandable, unbiased information	Addressee interests and capacities; technical feasibility
2. Social capital and network-building for implementation	Collaborative DMP	Implementation of and compliance with output in collaborative networks	Intensive repeated interaction; trust-building, sense of ownership	Participants' incentives, capacities, and role in implementation; shared motivation; redundancy of network relations

First, our treatment of (participatory) process features has deliberately remained rather abstract, owing to the goal of precisely describing causal mechanisms that are valid across a broad range of actual situations. Future research could link the identified mechanisms and internal conditioning factors to particular participatory formats and instruments, such as citizen juries, watershed collaborations, deliberative opinion polls, and so forth.

Second, while this study has focused on environmental decision making, several of the mechanisms described here are likely to have more general relevance and apply to other sectors, such as public health, spatial planning, or budgeting.

Third, we see great potential for this framework to structure and guide empirical research on the effectiveness of participatory governance. The mechanisms and variables put forth here could serve as a basis for the formation of testable hypotheses. One promising avenue by which to test such hypotheses is to conduct meta-analytical research to consolidate findings from the case record. Case-survey meta-analysis (Beierle & Cayford, 2002; Newig & Fritsch, 2009) provides a formal and structured means to draw upon the rich qualitative data contained in numerous (single) case studies. In an ongoing research program, we draw on this method to code a number of variables relating to context, process, and outcomes for a large-N sample of cases of participatory decision making (Newig et al., 2013). This will produce a semiquantitative dataset suitable for formal statistical analysis in order to shed light on the effect of key variables in various contexts. As a complementary method, there is considerable scope to employ causal process tracing (Mahoney, 2012) in order to assess the extent to which different mechanisms and clusters of mechanisms are relevant to particular cases, and to examine specific causal mechanisms. Both approaches, especially if employed in combination with other primary research methods such as comparative case studies, and field experimentation, have the potential to substantially improve our conceptual models and our knowledge on what works under what conditions in environmental governance.

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Notes

We acknowledge funding through grant NE 1207/2-1 “ECOPAG” by the German Research Foundation (DFG) and through Starting Grant 263859 “EDGE” by the European Research Council (ERC).

1. Out of 423 articles listed in Scopus containing “participatory governance” in title, abstract, or keywords, 46 percent were associated with European countries, 23 percent with North America, 9 percent with Asia. By contrast, out of 479 articles on “collaborative governance,” 40 percent were associated with North America, 29 percent with Europe, 10 percent with Asia (search date December 1, 2016).
2. We define stakeholders as actors potentially affected by the environmental problem and the consequences of possible solutions. These may be individual citizens or representatives of governmental, private sector, or civil society groups or organizations.
3. In line with much of the literature (e.g., Ansell & Gash, 2008), we define “outcomes” broadly as the ensemble of outputs and actions that follow from these, and subsequent implementation.
4. It is a truism that implementation and compliance do not necessarily advance the common good. Likewise, participatory and collaborative decision making may produce benefits “beyond compliance” (Rogers & Weber, 2010). For the sake of clarity and parsimony, we assume implementation of and compliance with policy outputs to be generally favorable in environmental terms.

References

- Aldred, Jonathan, and Michael Jacobs. 2000. “Citizens and Wetlands: Evaluating the Ely Citizens’ Jury.” *Ecological Economics* 34: 217–32.
- Amy, Douglas J. 1987. *The Politics of Environmental Mediation*. New York: Columbia University Press.
- Ansell, Chris. 2016. “Collaborative Governance as Creative Problem-Solving.” In *Enhancing Public Innovation by Transforming Public Governance*, ed. Jacob Torfing, and Peter Triantafyllou. Cambridge: Cambridge University Press, 35–44.
- Ansell, Chris, and Alison Gash. 2008. “Collaborative Governance in Theory and Practice.” *Journal of Public Administration Research and Theory* 18 (4): 543–71.
- Beierle, Thomas C., and Jerry Cayford. 2002. *Democracy in Practice: Public Participation in Environmental Decisions*. Washington, DC: Resources for the Future.
- Berry, Jeffrey M. 1981. “Beyond Citizen Participation: Effective Advocacy Before Administrative Agencies.” *Journal of Applied Behavioral Science* 17 (4): 463–77.
- Berry, William D., Matt Golder, and Daniel Milton. 2012. “Improving Tests of Theories Positing Interaction.” *Journal of Politics* 74: 653–71.
- Birnbaum, Simon. 2016. “Environmental Co-Governance, Legitimacy, and the Quest for Compliance: When and Why Is Stakeholder Participation Desirable?” *Journal of Environmental Policy & Planning* 18: 306–23.
- Booher, David E., and Judith E. Innes. 2002. “Network Power in Collaborative Planning.” *Journal of Planning Education and Research* 21 (3): 221–36.
- Brandt, Urs Steiner, and Gert Tinggaard Svendsen. 2013. “Is Local Participation Always Optimal for Sustainable Action? The Costs of Consensus-Building in Local Agenda 21.” *Journal of Environmental Management* 129: 266–73.
- Brody, Samuel D. 2003. “Measuring the Effects of Stakeholder Participation on the Quality of Local Plans Based on the Principles of Collaborative Ecosystem Management.” *Journal of Planning Education and Research* 22 (4): 407–19.
- Bulkeley, Harriet, and Arthur P. J. Mol. 2003. “Participation and Environmental Governance: Consensus, Ambivalence and Debate.” *Environmental Values* 12 (2): 143–54.
- Campbell, Joseph T., Tomas M. Koontz, and Joseph E. Bonnell. 2011. “Does Collaboration Promote Grass-Roots Behavior Change? Farmer Adoption of Best Management Practices in Two Watersheds.” *Society and Natural Resources* 24 (11): 1127–41.

- Chess, Caron, and Kristen Purcell. 1999. "Public Participation and the Environment: Do We Know What Works?" *Environmental Science & Technology* 33 (16): 2685–92.
- Choi, Taehyon, and Peter J. Robertson. 2014. "Deliberation and Decision in Collaborative Governance: A Simulation of Approaches to Mitigate Power Imbalance." *Journal of Public Administration Research and Theory* 24: 495–518.
- Coenen, Frans H. J. M., ed. 2008. *Public Participation and Better Environmental Decisions: The Promise and Limits of Participatory Processes for the Quality of Environmentally Related Decision-making*. Dordrecht, the Netherlands: Springer.
- Coglianesi, Cary. 1997. "Assessing Consensus: The Promise and Performance of Negotiated Rule-Making." *Duke Law Journal* 46: 1255–346.
- Connick, Sarah, and Judith E. Innes. 2003. "Outcomes of Collaborative Water Policy Making: Applying Complexity Thinking to Evaluation." *Journal of Environmental Planning and Management* 46 (2): 177–97.
- Cooke, Bill. 2001. "The Social Psychological Limits of Participation?" In *Participation: The New Tyranny?* ed. Bill Cooke and Uma Kothari. London: Zed Books, 102–21.
- Delli Carpini, Michael X., Fay Lomax Cook, and Lawrence R. Jacobs. 2004. "Public Deliberation, Discursive Participation, and Citizen Engagement: A Review of the Empirical Literature." *Annual Review of Political Science* 7: 315–44.
- Diduck, Alan, and A. John Sinclair. 2002. "Public Involvement in Environmental Assessment: The Case of the Nonparticipant." *Environmental Management* 29 (4): 578–88.
- Dietz, Thomas, and Paul C. Stern, eds. 2008. *Public Participation in Environmental Assessment and Decision-Making. Panel on Public Participation in Environmental Assessment and Decision Making, National Research Council*. Washington, DC: National Academic Press.
- Dryzek, John S. 2005. *The Politics of the Earth. Environmental Discourses*, 2nd ed. Oxford: Oxford University Press.
- Edelenbos, Jurian, Arwin Van Buuren, and Nienke van Schie. 2011. "Co-Producing Knowledge: Joint Knowledge Production Between Experts, Bureaucrats and Stakeholders in Dutch Water Management Projects." *Environmental Science and Policy* 14: 675–84.
- Elster, J. 1989. *Nuts and Bolts for the Social Sciences*. Cambridge, UK: Cambridge University Press.
- Elster, Jon. 2000. "Arguing and Bargaining in Two Constituent Assemblies." *Journal of Constitutional Law* 2 (2): 345–421.
- Emerson, Kirk, and Tina Nabatchi. 2015. *Collaborative Governance Regimes*. Washington, DC: Georgetown University Press.
- Emerson, Kirk, Tina Nabatchi, and Stephen Balogh. 2011. "An Integrative Framework for Collaborative Governance." *Journal of Public Administration Research and Theory* 22: 1–29.
- Falletti, Tulia G., and Julia F. Lynch. 2009. "Context and Causal Mechanisms in Political Analysis." *Comparative Political Studies* 42 (9): 1143–66.
- Fazey, Ioan, Anna C. Evely, Mark S. Reed, Lindsay C. Stringer, Joanneke Kruijsen, Piran C. L. White, Andrew Newsham et al. 2013. "Knowledge Exchange: A Review and Research Agenda for Environmental Management." *Environmental Conservation* 40 (1): 19–36.
- Fischer, Frank. 2000. *Citizens, Experts, and the Environment. The Politics of Local Knowledge*. Durham, NC: Duke University Press.
- Flynn, Brendan. 2008. "Planing Cells and Citizen Juries in Environmental Policy: Deliberation and Its Limits." In *Public Participation and Better Environmental Decisions. The Promise and Limits of Participatory Processes for the Quality of Environmentally Related Decision-Making*, ed. Frans H. J. M. Coenen. Enschede, the Netherlands: Springer, 57–71.
- Fung, Archon. 2006. "Varieties of Participation in Complex Governance." *Public Administration Review* 66 (Special Issue): 66–75.
- Fung, Archon, and Erik Olin Wright. 2001. "Deepening Democracy: Innovations in Empowered Participatory Governance." *Politics & Society* 29 (1): 5–41.
- Geissel, Brigitte. 2009. "Participatory Governance: Hope or Danger for Democracy? A Case Study of Local Agenda 21." *Local Government Studies* 4: 401–14.

- Gerlak, Andrea K., Mark Lubell, and Tanya Heikkilä. 2013. "The Promise and Performance of Collaborative Governance." In *The Oxford Handbook of US Environmental Policy*, ed. Sheldon Kamieniecki, and Michael Kraft. New York: Oxford University Press, 413–34.
- Goodin, Robert E. 1992. *Green Political Theory*. Cambridge, UK: Polity Press.
- Hedström, Peter, and Petri Ylikoski. 2010. "Causal Mechanisms in the Social Sciences." *Annual Review of Sociology* 36: 49–67.
- Heikkilä, Tanya, and Andrea K. Gerlak. 2013. "Building a Conceptual Approach to Collective Learning: Lessons for Public Policy Scholars." *Policy Studies Journal* 41 (3): 484–512.
- Heinelt, Hubert. 2002. "Achieving Sustainable and Innovative Policies through Participatory Governance in a Multi-Level Context: Theoretical Issues." In *Participatory Governance in Multi-Level Context. Concepts and Experience*, ed. Hubert Heinelt, Panagiotis Getimis, Grigoris Kafkalas, Randall Smith, and Erik Swyngedouw. Opladen, Germany: Leske + Budrich, 17–32.
- Holzinger, Katharina. 2000. "Limits of Co-Operation: A German Case of Environmental Mediation." *European Environment* 10 (6): 293–305.
- Hurlbert, Margot, and Joyeeta Gupta. 2015. "The Split Ladder of Participation: A Diagnostic, Strategic, and Evaluation Tool to Assess When Participation is Necessary." *Environmental Science & Policy* 50: 100–13.
- Innes, Judith E., and David E. Booher. 1999. "Consensus Building and Complex Adaptive Systems. A Framework for Evaluating Collaborative Planning." *Journal of the American Planning Association* 65 (4): 412–23.
- . 2004. "Reframing Public Participation: Strategies for the 21st Century." *Planning Theory & Practice* 5 (4): 419–36.
- Irvin, René A., and John Stansbury. 2004. "Citizen Participation in Decision Making. Is It Worth the Effort?" *Public Administration Review* 64 (1): 55–65.
- Johnston, Erik W., Darrin Hicks, Ning Nan, and Jennifer C. Auer. 2011. "Managing the Inclusion Process in Collaborative Governance." *Journal of Public Administration Research and Theory* 21: 699–721.
- Koontz, Tomas M. 1999. "Citizen Participation: Conflicting Interests in State and National Agency Policy Making." *The Social Science Journal* 36 (3): 441–58.
- Koontz, Tomas M., and Craig W. Thomas. 2006. "What Do We Know and Need to Know about the Environmental Outcomes of Collaborative Management?" *Public Administration Review* 66 (Suppl. 1): 111–21.
- Laird, Frank N. 1993. "Participatory Analysis, Democracy, and Technological Decision Making." *Science, Technology, & Human Values* 18 (3): 341–61.
- Lange, Philipp, Peter P. J. Driessen, Alexandra Sauer, Basil Bornemann, and Paul Burger. 2013. "Governing Towards Sustainability—Conceptualizing Modes of Governance." *Journal of Environmental Policy and Planning* 15 (3): 403–25.
- Larson, Kelli L., and Denise Lach. 2008. "Participants and Non-Participants of Place-Based Groups: An Assessment of Attitudes and Implications for Public Participation in Water Resource Management." *Journal of Environmental Management* 88: 817–30.
- Layzer, Judith A. 2002. "Citizen Participation and Government Choice in Local Environmental Controversies." *Policy Studies Journal* 30 (2): 193–207.
- . 2008. *Natural Experiments: Ecosystem-Based Management and the Environment*. Cambridge, MA: MIT Press.
- Leach, William D., and Neil W. Pelkey. 2001. "Making Watershed Partnerships Work: A Review of the Empirical Literature." *Journal of Water Resources Planning and Management* 127 (6): 378–85.
- Leach, William D., and Paul A. Sabatier. 2005. "To Trust an Adversary: Integrating Rational and Psychological Models of Collaborative Policymaking." *American Political Science Review* 99 (4): 491–503.
- Ley, Aaron J., and Edward P. Weber. 2015. "The Adaptive Venue Shopping Framework: How Emergent Groups Choose Environmental Policymaking Venues." *Environmental Politics* 24: 703–22.

- Lind, Edgar A., and Tom R. Tyler. 1988. *The Social Psychology of Procedural Justice*. New York: Plenum Press.
- Lubell, Mark. 2013. "Governing Institutional Complexity: The Ecology of Games Framework." *Policy Studies Journal* 41 (3): 537–59.
- Mahoney, James. 2012. "The Logic of Process Tracing Tests in the Social Sciences." *Sociological Methods and Research* 41 (4): 570–97.
- Miller, David. 1992. "Deliberative Democracy and Social Choice." *Political Studies* 40 (1): 54–67.
- Newig, Jens. 2007. "Does Public Participation in Environmental Decisions Lead to Improved Environmental Quality? Towards an Analytical Framework." *Communication, Cooperation, Participation (International Journal of Sustainability Communication)* 1 (1): 51–71.
- . 2012. "More Effective Natural Resource Management through Participatory Governance? Taking Stock of the Conceptual and Empirical Literature—and Moving Forward." In *Environmental Governance. The Challenge of Legitimacy and Effectiveness*, ed. Karl Høgl, Eva Kvarda, Ralf Nordbeck, and Michael Pregernig. Cheltenham, UK: Edward Elgar, 46–68.
- Newig, Jens, Ana Adzersen, Edward Challies, Oliver Fritsch, and Nicolas Jager. 2013. *Comparative Analysis of Public Environmental Decision-Making Processes: A Variable-Based Analytical Scheme*. INFU Discussion Paper No. 37/13. Lüneburg, Germany: INFU. Available at https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2245518.
- Newig, Jens, and Oliver Fritsch. 2009. "Environmental Governance: Participatory, Multi-Level—And Effective?" *Environmental Policy and Governance* 19 (3): 197–214.
- Newig, Jens, and Eva Kvarda. 2012. "Participation in Environmental Governance: Legitimate and Effective?" In *Environmental Governance. The Challenge of Legitimacy and Effectiveness*, ed. Karl Høgl, Eva Kvarda, Ralf Nordbeck, and Michael Pregernig. Cheltenham, UK: Edward Elgar, 29–45.
- Newig, Jens, Claudia Pahl-Wostl, and Katja Sigel. 2005. "The Role of Public Participation in Managing Uncertainty in the Implementation of the Water Framework Directive." *European Environment* 15 (6): 333–43.
- Oh, Youngmin, and Carrie B. Bush. 2014. "Exploring the Role of Dynamic Social Capital in Collaborative Governance." *Administration & Society* 48: 216–36.
- Ostrom, Elinor. 1990. *Governing the Commons. The Evolution of Institutions for Collective Action, Political Economy of Institutions and Decisions*. Cambridge: Cambridge University Press.
- Pellizzoni, Luigi. 2003. "Uncertainty and Participatory Democracy." *Environmental Values* 12 (2): 195–224.
- Poocharoen, Ora-orn, and Bernard Ting. 2015. "Collaboration, Co-Production, Networks: Convergence of Theories." *Public Management Review* 17 (4): 587–614.
- Purdy, Jill M. 2012. "A Framework for Assessing Power in Collaborative Governance Processes." *Public Administration Review* 72: 409–17.
- Reed, Mark S. 2008. "Stakeholder Participation for Environmental Management: A Literature Review." *Biological Conservation* 114 (10): 2417–31.
- Renn, Ortwin. 2006. "Participatory Processes for Designing Environmental Policies." *Land Use Policy* 23: 34–43.
- Rhodes, Roderick A. W. 2008. "Policy Network Analysis." In *The Oxford Handbook of Public Policy*, ed. Michael Moran, Martin Rein, and Robert E. Goodin. Oxford: Oxford University Press, 425–47.
- Rockloff, Susan F., and Susan A. Moore. 2006. "Assessing Representation at Different Scales of Decision Making: Rethinking Local is Better." *Policy Studies Journal* 34 (4): 649–70.
- Rogers, Ellen, and Edward P. Weber. 2010. "Thinking Harder about Outcomes for Collaborative Governance Arrangements." *The American Review of Public Administration* 40 (5): 546–67.
- Rose-Ackerman, Susan. 1994. "Consensus vs. Incentives: A Skeptical Look at Regulatory Negotiation." *Duke Law Journal* 43 (6): 1206–20.
- Rowe, Gene, and Lynn J. Frewer. 2005. "A Typology of Public Engagement Mechanisms." *Science, Technology, & Human Values* 30: 251–90.
- Sabatier, Paul A., and Hank C. Jenkins-Smith. 1999. "The Advocacy Coalition Framework: An Assessment." In *Theories of the Policy Process*, ed. Paul A. Sabatier. Boulder, CO: Westview Press, 118–88.

- Sayles, Jesse S., and Jacopo A. Baggio. 2017. "Social-Ecological Network Analysis of Scale Mismatches in Estuary Watershed Restoration." *Proceedings of the National Academy of Sciences of the United States of America* 114: E1776–85.
- Schmitter, Philippe C. 2002. "Participation in Governance Arrangements: Is There Any Reason to Expect It Will Achieve 'Sustainable and Innovative Policies in a Multi-Level Context'?" In *Participatory Governance. Political and Societal Implications*, ed. Jürgen R. Grote, and Bernard Gbikpi. Opladen, Germany: Leske + Budrich, 51–69.
- Scott, Tyler A. 2015. "Does Collaboration Make Any Difference? Linking Collaborative Governance to Environmental Outcomes." *Journal of Policy Analysis and Management* 34 (3): 537–66.
- Scott, Tyler A., and Craig W. Thomas. 2017. "Unpacking the Collaborative Toolbox: Why and When Do Public Managers Choose Collaborative Governance Strategies?" *Policy Studies Journal* 45 (1): 191–214.
- Selin, Steve, and Deborah Chavez. 1995. "Developing a Collaborative Model for Environmental Planning and Management." *Environmental Management* 19 (2): 189–95.
- Smith, Graham. 2003. *Deliberative Democracy and the Environment*. London: Routledge.
- Stave, Krystyna A. 2002. "Using System Dynamics to Improve Public Participation in Environmental Decisions." *System Dynamics Review* 18 (2): 139–67.
- Susskind, Lawrence, and Jeffrey Cruikshank. 1987. *Breaking the Impasse. Consensual Approaches to Resolving Public Disputes*. New York: Basic Books.
- Susskind, Lawrence, Paul F. Levy, and Jennifer Thomas-Larmer, eds. 2000. *Negotiating Environmental Agreements. How to Avoid Escalating Confrontation, Needless Costs, and Unnecessary Litigation*. Washington, DC: Island Press.
- Susskind, Lawrence, Sarah McKernan, and Jennifer Thomas-Larmer, eds. 1999. *The Consensus Building Handbook: A Comprehensive Guide to Reaching Agreement*. Thousand Oaks, CA: Sage.
- Tsebelis, George. 1995. "Decision Making in Political Systems: Veto Players in Presidentialism, Parliamentarism, Multicameralism and Multipartism." *British Journal of Political Science* 25 (3): 289–325.
- Turner, Matthew A., and Quinn Weninger. 2005. "Meetings with Costly Participation: An Empirical Analysis." *Review of Economic Studies* 72 (1): 247–68.
- Ulibarri, Nicola. 2015. "Tracing Process to Performance of Collaborative Governance: A Comparative Case Study of Federal Hydropower Licensing." *Policy Studies Journal* 43 (2): 283–308.
- van Asselt, Marjolein B. A., and Jan Rotmans. 2002. "Uncertainty in Integrated Assessment Modelling: From Positivism to Pluralism." *Climatic Change* 54 (1–2): 75–105.
- van Meter, Donald S., and Carl E. van Horn. 1975. "The Policy Implementation Process. A Conceptual Framework." *Administration & Society* 6 (4): 445–88.
- Webler, Thomas, and Seth Tuler. 2000. "Fairness and Competence in Citizen Participation." *Administration & Society* 32 (5): 566–95.
- . 2006. "Four Perspectives on Public Participation Process in Environmental Assessment and Decision Making: Combined Results from 10 Case Studies." *Policy Studies Journal* 34 (4): 699–722.
- Weible, Christopher M., and Paul A. Sabatier. 2005. "Comparing Policy Networks: Marine Protected Areas in California." *Policy Studies Journal* 33 (2): 181–202.
- Whelan, James, and Kristen Lyons. 2005. "Community Engagement or Community Action: Choosing Not to Play the Game." *Environmental Politics* 14 (5): 596–610.
- Wondolleck, Julia, and Steven Lewis Yaffee. 2000. *Making Collaboration Work. Lessons from Innovation in Natural Resource Management*. Washington, DC: Island Press.
- Wong, James K. 2015. "A Dilemma of Green Democracy." *Political Studies* 64: 136–55.
- Wynne, Brian. 1992. "Misunderstood Misunderstanding: Social Identities and Public Uptake of Science." *Public Understanding of Science* 1 (3): 281–304.
- Young, Juliette C., Andrew Jordan, Kate R. Searle, Adam Butler, Daniel S. Chapman, Peter Simmons, and Allan D. Watt. 2013. "Does Stakeholder Involvement Really Benefit Biodiversity Conservation?" *Biological Conservation* 185: 359–70.